. Answer *any* **six** of the following questions : 2×6=12

(a) What do you mean by conductivity and mobility in case of semiconductor? Write their units.

(b) Draw a circuit diagram of c-filter.

(c) What do you mean by α and β in case of transistor? Write the relation between them.

(d) Define current gain and voltage gain in case of CE transistor amplifier.

(e) Which type of feedback circuit is needed for amplification and why?

(f) What do you mean by A/D and D/A converters?

(g) Write the characteristics of an ideal OpAmp.

(h) What is CMRR in case of op amp?

1. Answer any *six* of the following questions : 2×6=12

(a) Draw the energy band diagram for *p*-type semiconductor and *n*-type semiconductor.

(b) What is LED? Which type of semiconductor is suitable for manufacturing LED?

(c) Explain why a transistor needs biasing.

(d) What do you mean by load line in a transistor CE amplifier?

(e) What is Barkhausen criterion for a feedback amplifier to function as an oscillator?

(f) When a negative feedback is applied to an amplifier of gain 100, the overall gain reduces to 50. Find the fraction of output voltage feedback.

(g) State the characteristics of an ideal OP AMP.

(h) Define slew rate of an OP AMP.

SECTION—A

1. Answer *any* **six** questions from the following : 2×6=12

(a) Write two basic differences between *p*-type and *n*-type semiconductors.

(b) Define drift velocity and write its dimensional formula.

(c) What do you mean by class *A*, *B* and *C* amplifiers?

(d) What do you mean by *h*-parameter of an equivalent circuit of transistor?

(e) Write two basic differences between positive feedback and negative feedback.

(f) Define oscillator and write their two applications.

(g) Write the characteristics of an ideal op-amp.

(h) Explain the concept of virtual ground of op-amp.